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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:
TERUO KOMORI, ET AL.	: EXAMINER: BALDWIN, GORDON
SERIAL NO: 10/530,561	:
FILED: APRIL 7, 2005	: GROUP ART UNIT: 1794
FOR: HONEYCOMB STRUCTURE	:

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a Notice of Appeal.

The review is requested for the reason(s) stated on the attached sheet(s). No more than five (5) pages are provided.

I am the attorney or agent of record.

Respectfully submitted,

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In the outstanding Office Action and as maintained in the Advisory Action, Claims 1-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 2001-334114 (hereinafter "("Motoshige") in view of Ichikawa et al (U.S. Patent No. 7,056,568).

THE OFFICE ACTION HAS NOT SHOWN ANY SURFACE ROUGHNESS TEACHING IN THE APPLIED ART, MUCH LESS A TEACHING OF THE CLAIMED RANGE.

THE OFFICE ACTION HAS NOT SHOWN SURFACE ROUGHNESS IN THE CONTEXT OF THE CLAIMED INVENTION TO BE A RESULT EFFECTIVE VARIABLE.

THE ADVISORY ACTION WRONGLY DISCOUNTS APPLICANTS' UNEXPECTED RESULTS, WHICH ARE RE-PRESENTED HERE WITH A CLEARER EXPLANATION.

Claim 1 recites:

> A honeycomb structural body comprising:
> at least one pillar-shaped porous ceramic member comprising a silicon-ceramic composite material, the silicon-ceramic composite material comprising a silicon constituent and a ceramic constituent, the at least one pillar-shaped porous ceramic member having a plurality of through-holes extending in a longitudinal direction of the at least one pillar-shaped porous ceramic member and a plurality of partitions separating the through-holes,
> wherein
> the through-holes are plugged such that an opening area at one end face of the at least one pillar-shaped porous ceramic member is different from an opening area at the other end face of the at least one pillar-shaped porous ceramic member, and
> ***a surface roughness of the partition in the porous ceramic member is 1.0-30.0 μm.*** [Emphasis Added.]

The Advisory Action indicates that:

> The first reason the Applicant's argument is not persuasive is because it is not understood exactly how the Applicant's honeycomb structure would have a different roughness on the partition walls than the Motoshige reference. Motoshige utilizes the same material to make a honeycomb structural body to filter exhaust gas. Absent a secondary treatment to give a particular roughness to the interior of the honeycomb structure on the partition walls, there seems to be no difference between the claimed structure and the Motoshige reference. Secondly, the "precipitous change" in the accumulation of ash does not appear to be that great over the whole claimed range of 1-30 microns. For instance, in the fired body section on the Applicant's table 3, when the Ra of example 3.6 is half the value of example 3.1, there is only a 0.05 difference in the accumulated ratio of ash. The range claimed by the Applicant is very large and the entire range is not considered to show the unexpected results needed to overcome the prior art of record.

Regarding the first reason given in the Advisory Action as to why Applicants' arguments were not persuasive, Applicant's specification at pages 58 and 59, provide seven (7) examples of processing porous ceramic structures to obtain different surface roughness values. The first five (5) examples involve the use of different surface roughness slit surfaces for the extrusion die to produce different roughness values in the resulting porous ceramic structures. The last two (2) examples use different acrylic resin particles in the molds to make different roughness values in the resulting porous ceramic structures. Applicant sees **no** teaching in Motoshige of extruding through extrusion dies of different surface roughness values or the use of different aspect ratio acrylic resin particles.

There is no basis for the examiner to know what the surface roughness of the pororus ceramic in Motoshige is or if it is even close or overlapping with the claimed surface roughness. Indeed, the Examiner has cited no part of Motoshige for a teaching of any surface roughness. The Examiner merely asserts on page 4 of the Office Action that:

> Consider claim 8, Motoshige discloses the claimed invention except for the surface roughness of the partition of the ceramic member. It would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the surface roughness for the desired application, since it has been held that discovering an optimum value of a result effective

> variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

M.P.E.P. § 2144.05 states that only result-effective variables can be optimized. In particular, M.P.E.P. § 2144.05 II B states

> A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation.

With neither reference indicating any significance for optimizing surface roughness, the Office has not established from the art that surface roughness is a result-effective variable for porous ceramic members. Only Applicants' specification as noted above provides a rationale for the claimed range of surface roughness.

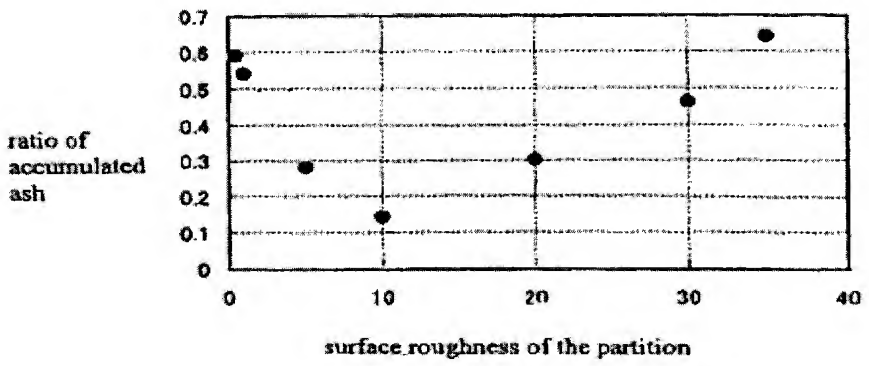
On this ground alone, a case of *prima facie* obviousness has not been established against Claim 1, and the 35 U.S.C. § 103(a) rejection should be reversed.

Regarding the second reason given in the Advisory Action as to why Applicants' arguments were not persuasive, as Applicants explained in the specification at page 15, line 31, to page 16, line 10:

> In the invention, the surface roughness of the partition is desirable to be within a range of 1.0-30.0 μm as calculated in terms of arithmetic mean roughness (Ra) defined in JIS B 0601-2001.
>
> When the surface roughness (Ra) of the partition is less than 1.0, the mechanism is not clear, but the inflow of the exhaust gas hardly occurs and also the Young's modulus is low, so that the vibrations through the inflow of the exhaust gas hardly occurs, and the effect of peeling the ash becomes small. On the other hand, when the surface area (Ra) of the partition exceeds 30.0 μm, the inflow of exhaust gas easily occurs, but the vibration is not resonated but cancelled, so that it is considered that the effect of peeling the ash becomes small.

Furthermore, Applicant filed in the last reply the graph reproduced below of their results from Table 3 of the specification. This graph shows the effect of surface roughness on the accumulation of ash. This data shows the criticality of the claimed range. The Examiner questions whether the change is a significant enough change to warrant patentability.

First of all, the Examiner will appreciate that one would normally expect that a rougher surface would retain more ash as there effectively is more surface area per volume of the porous ceramic for the ash to adhere to as the surface roughness increases. Thus, Applicants results from 1 to 10 μm of surface roughness show an unexpectedly reduction in the ratio of accumulated ash while the surface roughness is increasing. These results are thus contrary to accepted wisdom. See M.P.E.P. § 2145 X D (3).



Moreover, the change shown above is almost exactly the same **kind and magnitude** as in In re Waymouth and Koury 499 F2d 1273, 182 USPQ 290 (CCPA 1974) where the Court recognized an improved light efficiency over a conventional lamp as an unexpected result that was a difference in kind not degree. The Appellants results there in In re Waymouth and Koury are reproduced below.

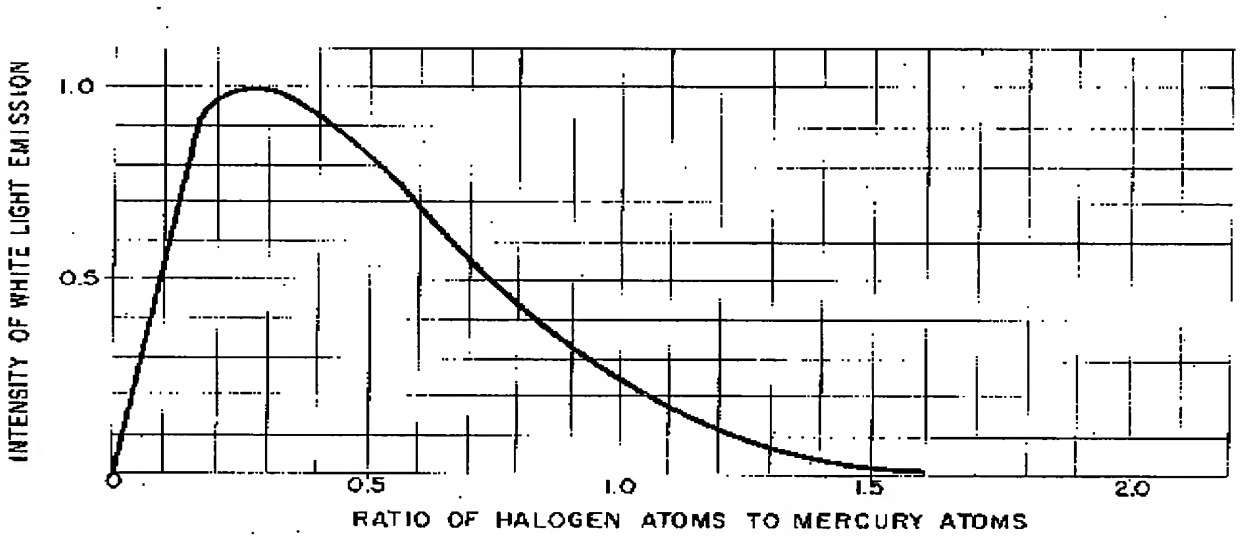


FIG. 2

In other words, Applicants results (like those in In re Waymouth and Koury) show an unexpected departure from what would normally be expected - -that is normally one would expect a linear change between end points which for Applicant's results shown above would be expected to linearly increase with increasing surface roughness..

Hence, Applicants results should be considered a secondary evidence for the non-obviousness of the claimed invention,

Thus, for all these reasons, the 35 U.S.C. § 103(a) rejection should be removed.